

## Emissions Inventory Help Sheet for Reports Using EPA's TANKS 3.1 Program

This help sheet supplements the “Instructions for Reporting 1999 Annual Air Pollution Emissions,” which you should refer to for additional information related to your report. These instructions are for facilities required to calculate emissions using the EPA TANKS 3.1 program. Although the TANKS 4 series has been released, EPA has acknowledged continuing problems with its implementation, thus you should continue to use TANKS 3.1 to calculate your 1999 emissions.

### What do I have to report?

You should report or account for the following three categories of **aboveground tank-related** emissions:

- Working Losses
- Standing Losses
- Loading Emissions

For the 1999 Annual Emissions Inventory, the only reportable tank-related pollutants are **volatile organic compounds (VOCs)**. These pollutants are reported on **Evaporative Process Forms**.

### How do I calculate working and standing losses?

Use TANKS 3.1 to calculate working and standing loss emissions. The TANKS 3.1 program can be found on the Internet at <http://www.epa.gov/ttn/chief/tanks.html> or is available from us on diskette. If you need a copy of the software on diskette, or help in running the program, contact Jess Lotwala at (602) 506-6735.

Working and standing losses are reported separately for each tank that meets any of the following criteria:

1. a tank which stored gasoline,
2. a non-gasoline tank which had at least 100 pounds of working + standing annual emissions. (A prior year determination with the same product is satisfactory.)

If you modified a tank, added a tank, or changed products in a tank in 1999, contact Jess Lotwala at (602) 506-6735 for further instructions.

### How do I fill out the Evaporative Process Form for working and standing losses?

Your Evaporative Process Forms should be preprinted in the correct format. For changes or first-time reports, use a separate form for each *type* of aboveground tank, specifically the following: horizontal fixed roof, vertical fixed roof, internal floating roof, and external floating roof tanks. Each tank has two processes with separate process ID numbers. One process is working losses and the other is standing losses.

Print a “summary” report from TANKS 3.1 to show working and standing losses for each tank. We are calling “working loss” what TANKS 3.1 terms either “working” or “withdrawal” loss. “Standing loss” is the sum of from one to four types of standing losses. If there is more than one type, TANKS 3.1 sums them as “total standing loss.”

### How do I determine the emission factors (EF) for working and standing losses?

**Working loss** emissions for a tank vary by throughput, so an EF for throughput is back-calculated. Show the number of gallons of throughput in column 10. Show the working loss emissions (calculated by TANKS 3.1) in column 16. Calculate the working loss EF for column 12 by dividing the working loss emissions by the number of gallons of throughput. This will give you an EF expressed in pounds per gallon (lb/gal).

Example:      working loss emissions = 3,155 lb.  
                 total product throughput = 6,123,789 gal.  
                 EF =  $3,155 / 6,123,789 = 0.000515$  lb/gal

**Standing loss** emissions for a tank are generally stable from year to year. Report the EF as “1 lb/lb.” Enter pounds of total standing loss emissions (calculated by TANKS 3.1) in both column 10 as the quantity measured and column 16 as the resulting emissions.

### **How do I fill out the Evaporative Process Form for loading emissions?**

For loading using an emission control device other than vapor balance, the business which operated the control device must report loading emissions and pay related fees for all the users. If your products were loaded using someone else’s control device, identify in an attachment whose control device was used and how many gallons of your product were loaded using that device in 1999.

Your forms should be preprinted with the correct format. For each product and each type of loading, enter the total gallons loaded in column 10 of the Evaporative Process Form. Then multiply the total gallons by the EF and enter the result in column 16.

Loading emissions are the vapors displaced when loading drums, tank trucks, rail cars, and fuel tanks of aircraft and vehicles. In addition, some sites which load aircraft or fleet vehicles have to report emissions from two loading transfers on site: first to a delivery truck, then to the aircraft or vehicles. For changes or first-time reports, show each applicable emission factor as a separate process with a separate process ID number. Examples: All gasoline loaded into tank trucks using a particular control device would be shown as one process ID. Another process ID number would be assigned to all gasoline loaded into fleet vehicles from a tank truck. Other process ID numbers would be assigned to other fuels loaded into tank trucks, etc.

### **How do I determine the emission factors (EF) for Loading Emissions?**

There are several ways to determine EFs for bulk loading.

1. If you had no vapor control device, you may use the default EFs in column D of Table 1: BULK LOADING DEFAULT EMISSION FACTORS, on the following page. This table covers standard fuels at Maricopa County average ambient temperature. They are calculated from the parameters shown in column C using the EPA equation shown afterward.
2. If you had no vapor control device, and if different products or different parameter(s) apply to your operation from what is given in Table 1, use the EPA equation shown on the next page and attach an Emission Factor Calculation Form showing the calculations.
3. If you used a vapor balance system to control vapors, use an EF from Table 1: BULK LOADING DEFAULT EMISSION FACTORS, or calculate one using the EPA formula. Show the reduction in emissions by entering 100% for capture efficiency and 90% for control efficiency in columns 14 and 15 of the Evaporative Process Form. The generic formula for this way of calculating emissions is:

$$\text{gallons of throughput} \times \text{emission factor (lbs/gal)} \times [ 1 - (\% \text{ capture} \times \% \text{ control}) ] = \text{Emissions (lbs/yr)}$$

$$\text{or specifically in this case: } \text{gallons of throughput} \times \text{emission factor} \times 0.1 = \text{Emissions (lbs/yr)}$$

4. If you used a thermal oxidizer or condenser vapor control device, use a pound-per-gallon EF derived from annual test results for your system. Use the highest EF value if there were multiple tests during the year. If there was no test done during the year, use the EF from the most recent test results. Attach test identification, date and summary of emission test results. If a pound-per-gallon EF is not shown on the summary of test results, show how the EF was calculated on an Emission Factor Calculation Form.

Provide a vapor control device ID number on the Control Device Form. Enter the control device ID number on the Evaporative Process Form, but do not enter capture or control efficiencies, since the EF already accounts for capture and control. Fill out a Stack Form if required.

**Table 1: BULK LOADING DEFAULT EMISSION FACTORS**

A. PRODUCT	B. TRANSFER TO	C. PARAMETERS				D. EMISSION FACTOR (LB/GAL)
		T	P	S	M	
Gasoline (10 RVP or less):	Tank trucks	535	6.8	1	66	.01045
	Rail cars	535	6.8	0.6	66	.00626
Avgas (6 RVP):	Tank trucks	535	4.0	1	68	.00633
	Rail cars	535	4.0	0.6	68	.00381
	Aircraft	535	4.0	1.45	68	.00919
JP-4/Naphtha:	Tank trucks	535	1.8	1	80	.00336
	Rail cars	535	1.8	0.6	80	.00201
	Aircraft	535	1.8	0.6	80	.00201
Kerosene, Jet A, or #1 Diesel:	Tank trucks	535	0.013	1	130	.000039
	Rail cars	535	0.013	0.6	130	.0000236
	Aircraft	535	0.013	0.6	130	.0000236
#2 Fuel Oil, or Diesel:	Tank trucks	535	0.0105	1	130	.0000318
	Rail cars	535	0.0105	0.6	130	.0000191
#6 Fuel Oil:	Tank trucks	585	0.0007	1	190	.0000028
	Rail cars	585	0.0007	0.6	190	.0000017
Crude Oil (5 RVP):	Tank trucks	535	3.7	1	50	.00431
	Rail cars	535	3.7	0.6	50	.00259

EPA equation to calculate Loading Loss ( $L_L$ ) emission factor if not by stack test. (Source: EPA AP-42, Jan. 1995, Sec. 5.2.)

Use this equation for products or parameters other than those given in the table above. Reference South Coast Air Quality Management District for choice of "S" parameters. "M" and "P" are interpolated at 75°F from AP-42 Table 7.1-2 (9/97 p.7.1-49) except Avgas.

$$L_L = 12.46 \times \frac{S \times P \times M}{1000 \times T} \text{ lb/gallon loaded}$$

where:  $L_L$  = Loading loss before controls

S = Saturation factor:

For Tank Trucks and Rail Cars		S =
Submerged loading of clean cargo tank		0.50
Submerged loading: dedicated [same fuel] normal service		0.60
Submerged loading: dedicated [same fuel] vapor balance service		1.00
Splash loading of a clean cargo tank		1.45
Splash loading: dedicated [same fuel] normal service		1.45
Splash loading: dedicated [same fuel] vapor balance service		1.00

P = True vapor pressure of liquid loaded, psia, at actual temperature

M = Mol. Wt., lb/lb mole (condensed vapors), at actual temperature

T = Temperature (°R) of bulk liquid loaded, °R = °F + 460 (metro. Phoenix average temp = 75°F)

## GENERAL NOTES

- Pay attention to TANKS 3.1 messages if they indicate significant discrepancies in volume or turnover calculations. Corrections to tank measurements may be needed.
- If the contents of a tank were changed during the year, contact Jess Lotwala at (602) 506-6735 for additional guidance on reporting.
- **Excess emissions and accidental releases.** These emissions come from down-time or malfunctioning of control devices or from leaks or spills. Such emissions must be reported to the Department immediately when they occur as well as in this annual report. Show the total on the “Accidental Releases” line of the Data Certification and Fee Calculation Sheet.

## CHECKLIST

Your 1999 report needs to include the following:

- Business Form
- Evaporative Process Form for each type of tank
- TANKS 3.1 Summary Report printout
- TANKS 3.1 backup on diskette (or by e-mail to [janthony@mail.maricopa.gov](mailto:janthony@mail.maricopa.gov)).
  - a) A backup consists of two zip files (a SYSxxxx.zip and a TANKxxxx.zip file) created by the TANKS 3.1 program.
  - b) Access this feature in TANKS through menu item 4. Database Utilities; 8. Backup/Restore from Backup; 1. Backup.
  - c) Enter the drive letter and directory path where you want the backup file to be located, suggested to your own hard-drive so you will also have the same backup files that you submit. (Press “enter.”)
  - d) The default name for the two zip files will be SYSxxxx.zip and TANKxxxx.zip where xxxx is the month and date (MMDD) the backup is created (example: 0315 for March 15). MMDD can be replaced with any four alphanumeric characters if you wish.
- Loading alternatives:
  - a) If your product was loaded using an emissions control device operated by another company, on an attachment show the number of gallons of each product which was so loaded and name the company responsible for the control device.
  - b) For all other product loading, provide at least one Evaporative Process Form for loading. Also (if applicable) include an Emission Factor Calculation Form or summary of test results showing how the emission factor was calculated.
- Additional Evaporative or General Process Forms if you had any other types of emissions, such as tank purging, equipment leaks, pumpback emissions or combustion emissions.
- Data Certification/Fee Calculation Form
- Fee payment (if applicable)